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**STATEMENT PRESENTED TO
EPA WORKSHOP ON GASOLINE SULFUR**

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Throughout my career, both at General Motors and now as a private consultant, I have been involved with issues relating to automotive emissions and fuels. I was part of the GM team that led the way to unleaded gasoline, low RVP gasoline, and reformulated gasoline. For each of these major contributions to cleaner air in the United States and elsewhere in the world, the U.S. oil industry had major objections involving cost, refinery modifications, and profitability. Each however succeeded, and now they are all listed and touted as oil industry accomplishments.

We now are faced with another issue regarding gasoline - reduction of its sulfur content. In this case, the API and NPRA have united on a proposal for a regional, summertime sulfur control strategy. This is progress, but the proposal is entirely inadequate. It does not come close to what is needed, which is imposition of the California gasoline sulfur standards nationwide, as proposed by the auto manufacturers and environmental community earlier today, and endorsed by the suppliers of catalysts and emission control systems.

My comments are based on a recent analysis, made by myself and Air Improvement Resources, Inc., of the sulfur content of gasoline in the United States. The AAMA's semi-annual gasoline surveys for 1996 were used. They cover about 800 samples obtained at service stations in 23 cities during January and July.

Figure 1 shows the annual average gasoline sulfur contents for 22 cities (all but Albuquerque). They range from a high of about 490 ppm for Chicago to lows of about 70 ppm for San Francisco and Los Angeles. The California sulfur requirements were not in effect during January 1996, accounting for the relatively high annual average for these two cities. In contrast, the summer averages for the two cities were about 25 ppm.

Several important points can be made from Figure 1.

1. All other things being equal, average vehicle exhaust emissions in non- California cities with high average gasoline sulfur contents, such as Chicago, St. Louis, New Orleans, Washington, DC, and Detroit, will be higher than in cities with low average gasoline sulfur contents, such as Boston, Phoenix, San Antonio, Minneapolis/St. Paul and Las Vegas.
2. The maximum vehicle emissions benefits of Federal Phase I RFG in RFG cities like Chicago, Washington, DC, Philadelphia, Dallas and New York will not be achieved because

of the high average gasoline sulfur contents in these cities.

Figure 2 shows, in addition to the annual average sulfur contents for the 22 cities, the ranges found, including the range for Albuquerque. The minimums were less than 25 ppm, even in non-California cities, and the maximums were over 1000 ppm in three cities, exceeding even the ASTM maximum of 1000 ppm. This figure vividly points out that some refiners, even outside of California, are already capable of meeting the California sulfur limits.

It is well established, that exhaust emissions for vehicles with operating catalytic emission control systems will decrease as the sulfur content of the gasoline decreases. This could lead to a very interesting strategy in areas that have I/M programs. To increase the probability of passing an I/M test, vehicle owners should use the lowest sulfur content gasoline that they can purchase. However, at present this information is unavailable to the public. If it was available, one would expect the public in I/M areas to purchase the low-sulfur gasolines, leading to an increased demand for those brands of gasoline with the lowest sulfur contents.

Figure 3 shows the annual average gasoline sulfur content, by service station brand (coded), for gasolines sold outside of California. The 17 brands shown are those with the largest number of samples in the AAMA survey (the number of samples obtained for each brand is roughly related to its annual gasoline sales). Several points can be made.

1. There is almost a three fold difference among the annual sulfur contents of the individual brands. Thus, some brands are more prepared to achieve the California gasoline sulfur requirements than others.
2. All other things being equal, the annual average sulfur content variations mean that the gasolines from some brands, on average, are causing greater tailpipe emissions from vehicles than others.

The only way that the inequities in vehicle exhaust emissions, due to variations in the sulfur content of gasolines by city and by brand, can be resolved is for the EPA to require gasoline sulfur content throughout the United States to be the same as that in California.

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Figure 1
Sulfur Results by City - Annual 1996

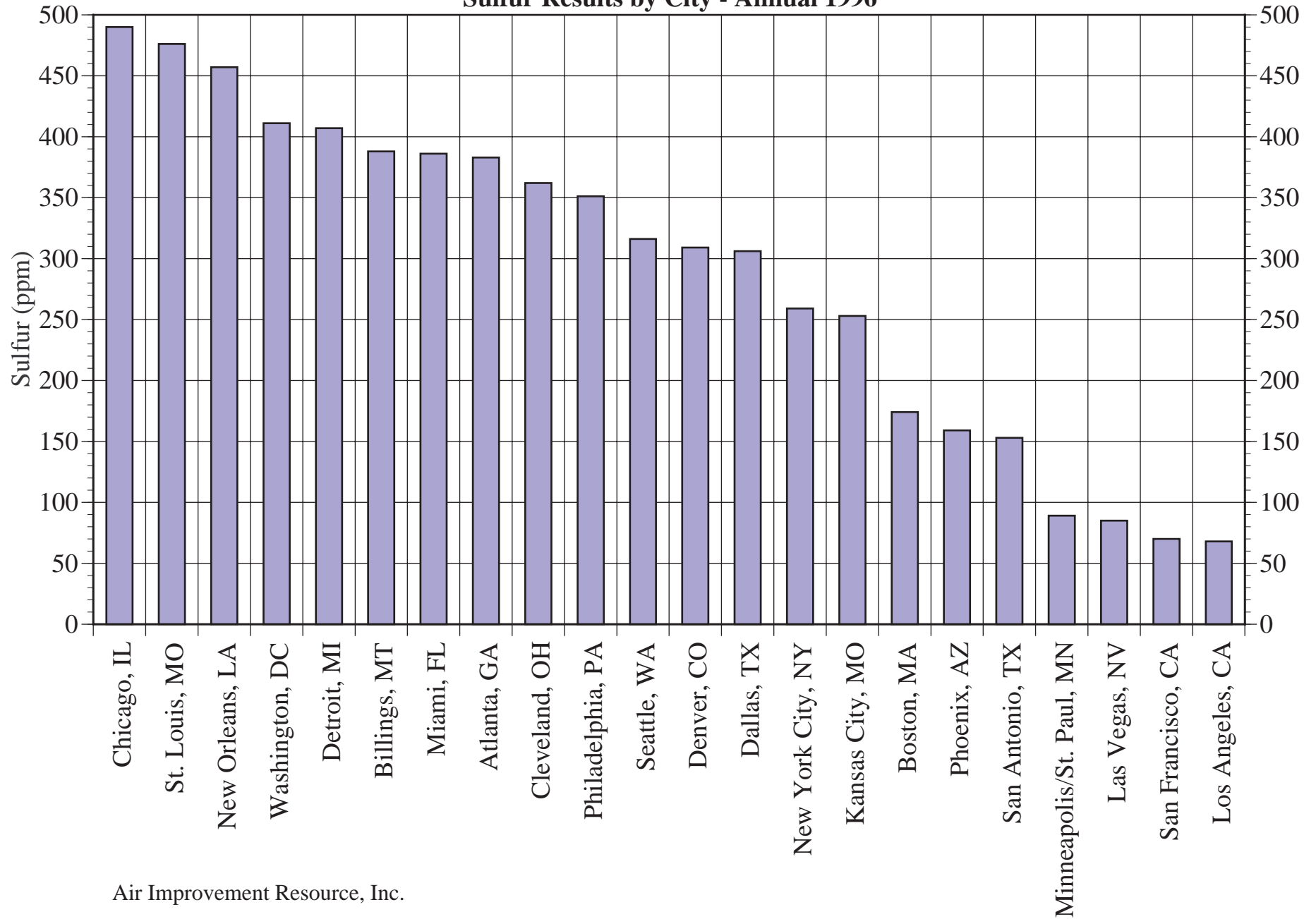


Figure 2
Average and Extreme Sulfur Levels by City
Annual - 1996

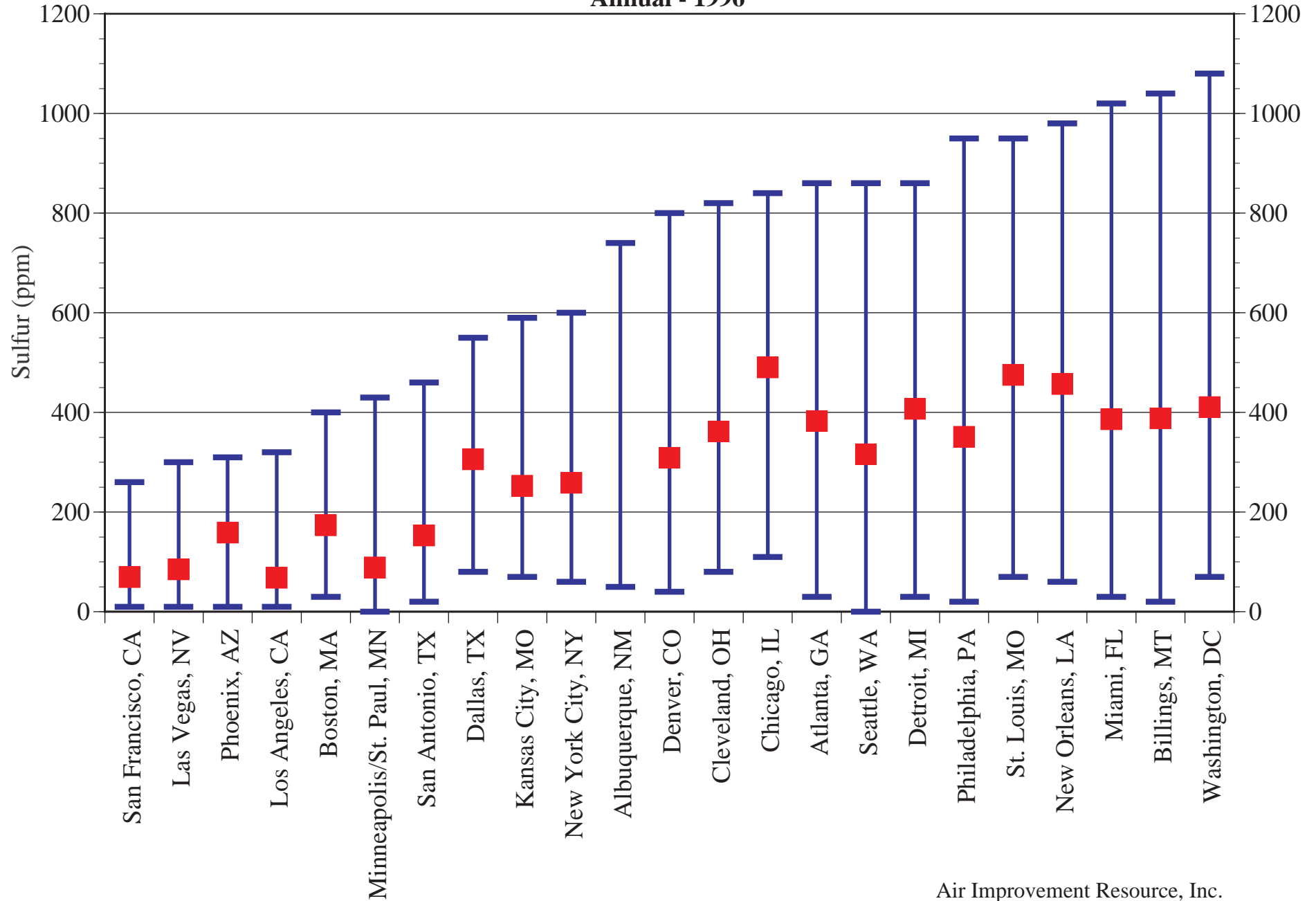


Figure 3
Sulfur Results by Brand - Annual 1996 - 49-States

